REMARKS

Reconsideration of the present application is respectfully requested.

Claims 44, 47 – 58, 61 - 65, and 67 – 69 as well as new claims 74 – 75 are pending. Claims 59 – 60 and 70 – 73 have been canceled without prejudice.

Claims 44, 47 – 56, 58 – 62, 64 and 67 – 69 have been rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,270,395 to Towery et al. (Towery). For the reasons discussed below, these claims, as amended, are now in condition for allowance.

Claim 44 has been amended to recite the novel embodiment disclosed, for example, on pg. 14, lines 19 – 26 in which a SiC wafer 4 is chemical mechanically polished (CMP) using a chemical solution 6 of hydrogen peroxide water and abrasive grains made of chromium (III) oxide, and a polishing cloth with a processing (polishing) pressure having a range of approximately 0.1 – 3.0 kgf/cm^2. As a result of this chemical solution, an oxygen concentration on the surface of the SiC wafer 4 is increased to promote the formation of an oxide on the SiC wafer 4. As discussed on, for example, pgs. 3 – 4, the use of a mechanically fragile reaction product such as the oxide permits polishing of the SiC wafer surface with less damage. Further, because of the increased oxygen concentration on the SiC surface, the SiC wafer can be polished at a lower pressure such as the pressure range recited in amended claim 44. In comparison, conventional SiC CMP processes require a pressure higher than this range because of the hardness of the SiC wafer. For example, in the CMP process disclosed in Kikuchi et al., a pressure of 0.34 MPa (3.5 kgf/ cm^2) is required. (See pg. 1, first paragraph of Kikuchi et al.).

Towery discloses a CMP process that includes the use of an oxidizing slurry for removing low dielectric materials of a semiconductor substrate. The oxidizing slurry is composed of

abrasive particles, which may be hydrated oxides of chromium, combined with an oxidizing agent, which may by hydrogen peroxide.

However, Towery fails to disclose that the CMP process is for a SiC wafer. Rather, Towery discloses a CMP process for a low dielectric layer of a silicon wafer. (See Col. 1, Lines 11 – 13 and Col. 5, Line 57). More specifically, the CMP process disclosed by Towery is for providing the capability of polishing low dielectric layers of silicon based devices.

Further, assuming *arguendo* that Towery discloses a CMP process for polishing a SiC wafer, Towery fails to disclose utilizing the hydrogen peroxide of the oxidizing slurry to increase the oxygen concentration on the surface of the wafer to promote the formation of an oxide thereon. Rather, Towery discloses utilizing this slurry to remove low dielectric materials such as, for example, organic polymer compounds. (See Col. 1, Lines 62 – 66 and Col. 2, Line 2). This is done by removing an electron from the low dielectric material during the polishing. (See Col. 9, Lines 51 – 53). However, the oxidizing slurry is not for generating oxygen.

Therefore, because Towery fails to disclose a CMP process for polishing SiC wafer or utilizing the oxidizing slurry to increase the oxygen concentration on the surface of the wafer to promote the formation of an oxide thereon, it is respectfully requested that the rejection of claim 44, as amended, be withdrawn.

Claims 47 – 56 and 58 – 60 depend from amended claim 44. Therefore, the rejection of these claims should be withdrawn for the above-mentioned reasons with respect to amended claim 44.

Claim 61 also recites a CMP apparatus for polishing a surface of the SiC wafer using abrasive grains made of chromium (III) oxide in a pressure range of 0.1 – 3.0 kgf/cm^2. The CMP apparatus includes supply means for supplying a chemical solution including the abrasive grains

and hydrogen peroxide water to the surface of the SiC wafer so that an amount of oxygen reacting with the SiC wafer in the polishing cloth is increased. As discussed above, Towery fails to disclose a CMP process for polishing SiC wafer or utilizing the oxidizing slurry to increase the oxygen concentration on the surface of the wafer to promote the formation of an oxide thereon.

Accordingly, it is respectfully requested that the rejection of claim 61, as well as dependent claims 62, 64 and 67 – 69 be withdrawn.

Claims 57, 63 and 65 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Towery in view of U.S. Patent No. 6,012,967 to Satake et al. (Satake). For the reasons discussed below, these claims are in condition for allowance.

Claim 57 depends from amended claim 44. Claims 63 and 65 depend from amended claim 61. Therefore, the rejection of these claims should be withdrawn for the above-mentioned reasons with respect to amended claims 44 and 61.

Claims 70 and 71 (and also 72 and 73) have been rejected under 35 U.S.C. 103(a) as being unpatentable over Towery in view of the Background Information of the present application. These claims have been canceled without prejudice.

New claims 74 – 75 are presented for examination. These claims recite features that further distinguish the present invention from the art of record. Support for new claim 74 can be found, for example, on pg. 8, line 17. Support for new claim 75 can be found, for example, on pg. 10, lines 5 – 6.

In view of the above amendments and remarks, the present application is now believed to be in condition for allowance. A prompt notice to that effect is respectfully requested.

Permission is given to charge any unanticipated fees to Deposit Account No. 50-1147.

Respectfully submitted,

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MARKED-UP VERSION OF THE AMENDED CLAIMS

Claims 44, 48, 52, 55, 61 and 69 have been amended as follows:

44. (Twice Amended) A method for mechanochemical polishing, comprising:

preparing a chemical solution that includes hydrogen peroxide water and abrasive grains made of chromium (III) oxide;

polishing a surface of a [semiconductor] SiC wafer by mechanochemical polishing using the chemical solution and a polishing cloth with a processing pressure having a range of approximately 0.1 – 3.0 kgf/cm^2; and

increasing oxygen concentration on the surface of the SiC wafer to promote the formation of an oxide of the SiC wafer by performing the polishing in the presence of the hydrogen peroxide water.

48. (Twice Amended) The method according to claim 44, wherein the method includes dropping the chemical solution onto the polishing cloth on the surface of the [semiconductor] SiC wafer.

52. (Twice Amended) The method according to claim 49, wherein the method includes dropping the chemical solution, in which the solid powder is dispersed, onto the surface of the [semiconductor] SiC wafer.

55. (Twice Amended) The method according to claim 53, wherein the method includes placing the solid powder on a member that is moved relatively to and contacts the surface of the [semiconductor] SiC wafer when the surface is polished.

61. (Twice Amended) A mechanochemical polishing apparatus, comprising:

a table on which [a semiconductor] an SiC wafer is held;

a polishing cloth facing the holding table and movable relatively with respect to the [semiconductor] SiC wafer to polish a surface of the [semiconductor] SiC wafer using abrasive grains made of chromium (III) oxide in a pressure range of approximately 0.1 – 3.0 kgf/cm^2 ; and

supply means for supplying a chemical solution including the abrasive grains and hydrogen peroxide water to the surface of the [semiconductor] SiC wafer, so that an amount of oxygen reacting with the SiC wafer in the polishing cloth is increased.

69. (Twice Amended) The apparatus according to claim 61, wherein the polishing cloth is comprised of suede [made of formed polyurethane].